

# COVID-19

## Infection Prevention & Control

# Benefits of IPC



Protecting yourself



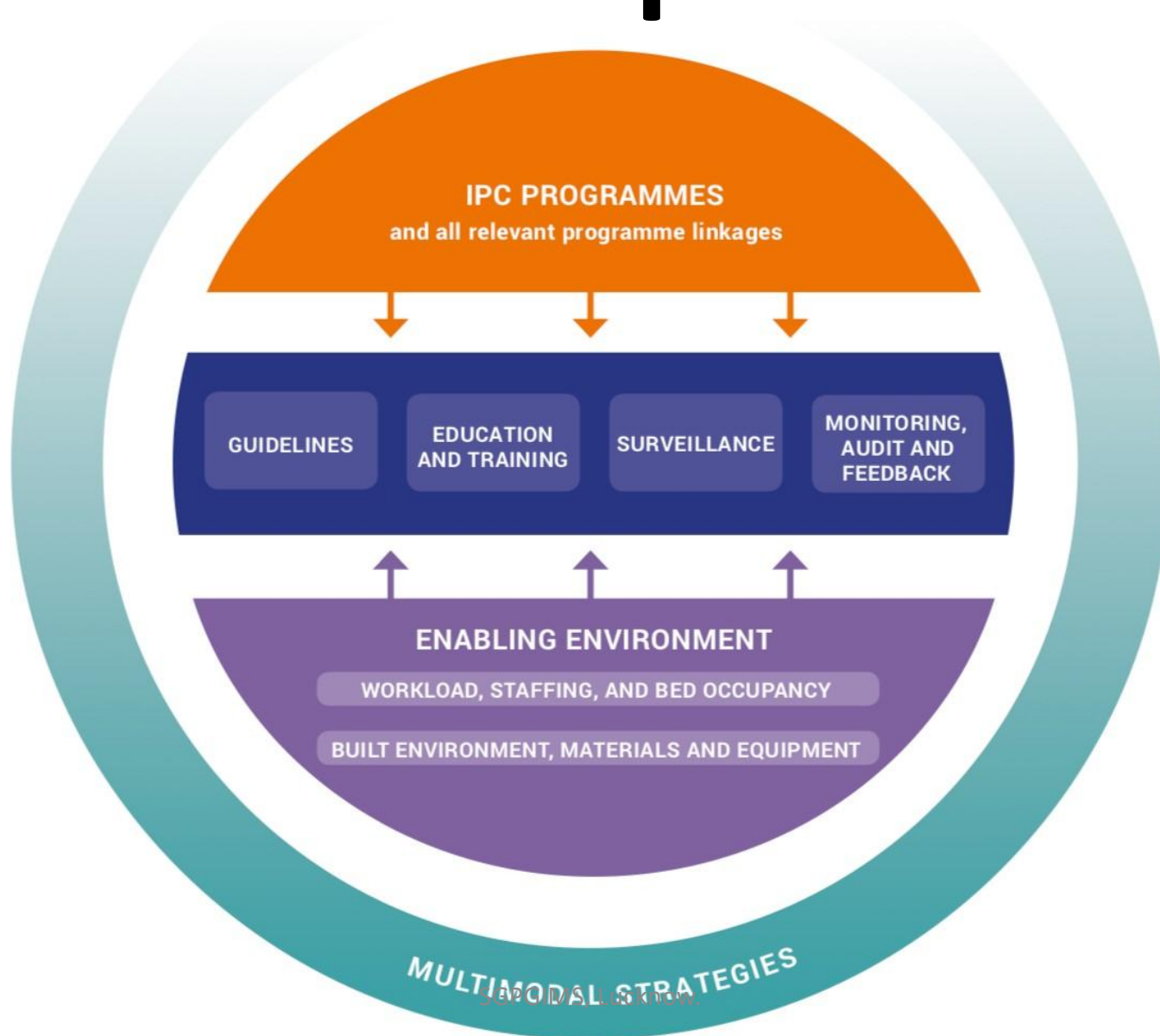
Protecting patients



Protecting your family & community

WHO2015 Safe & Quality Health Services Package

# Core Components





**World Health  
Organization**

# **Recommended IPC**

# Limiting COVID-19

- ☐ Apply

- ☐ Standard

- ☐ Droplet

- ☐ Airborne



Apply to all patients

- ☐ Triage, early recognition, and source control

- ☐ Empiric additional precautions for suspected cases of COVID-19

- ☐ Administrative controls; and

- ☐ Environmental & Engineering controls.

# Recommendation

## Applying standard precautions for all patients

# Standard Precautions

- ☐ Hand hygiene
- ☐ Respiratory hygiene (etiquette)
- ☐ PPE according to the risk
- ☐ Safe injection practices, sharps management and injury prevention
- ☐ Safe handling, cleaning and disinfection of patient care equipment
- ☐ Environmental cleaning
- ☐ Safe handling and cleaning of soiled linen
- ☐ Biomedical Waste management

# Chain of Infection

**Next Sick Person**

*(Susceptible Host)*



**Germ**

*(Agent)*



**Where Germs Live**

*(Reservoir)*



**How Germs Get Out**

*(Portal of Exit)*



**Germs Get Around**

*(Mode of Transmission)*



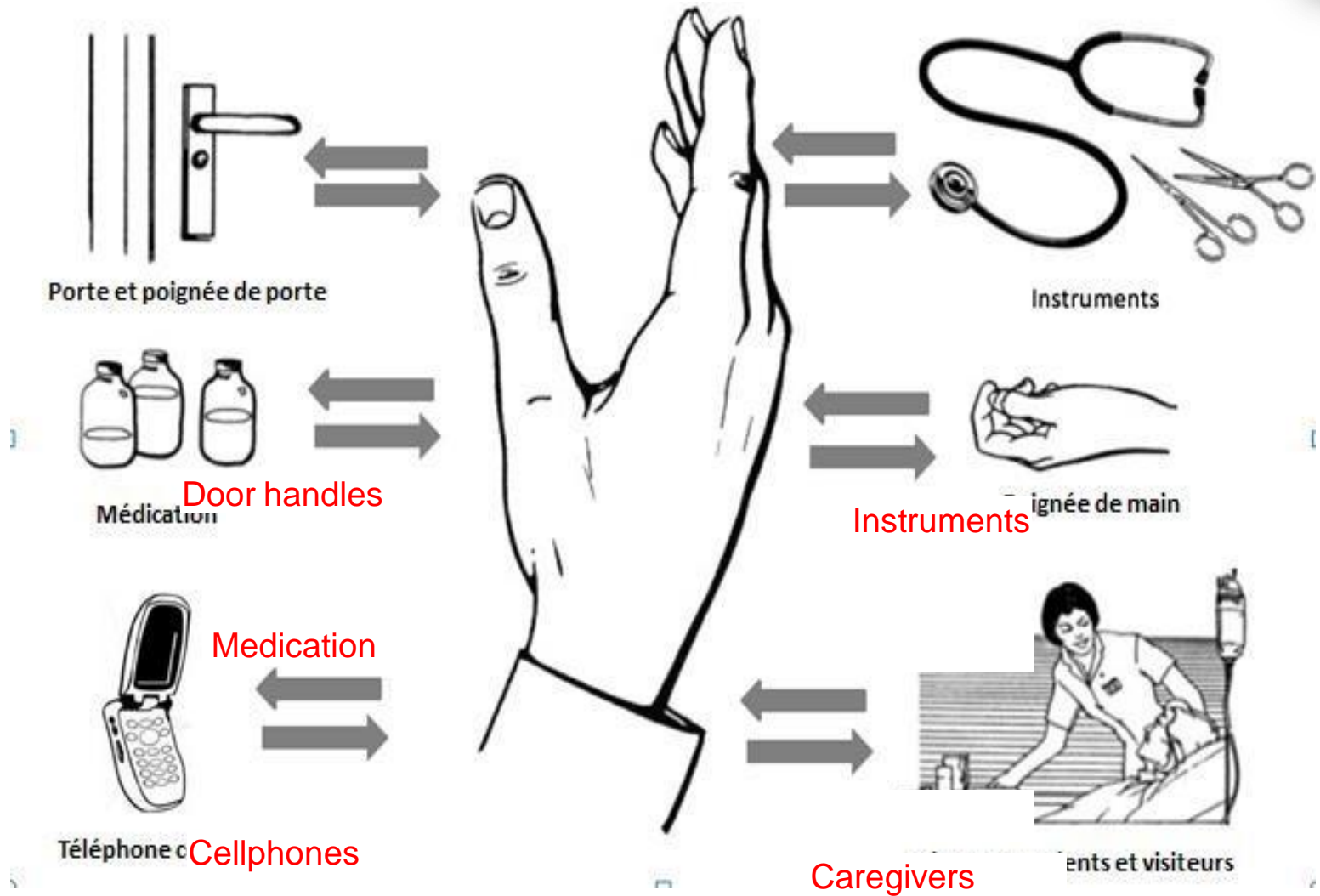
**How Germs Get In**

*(Portal of Entry)*





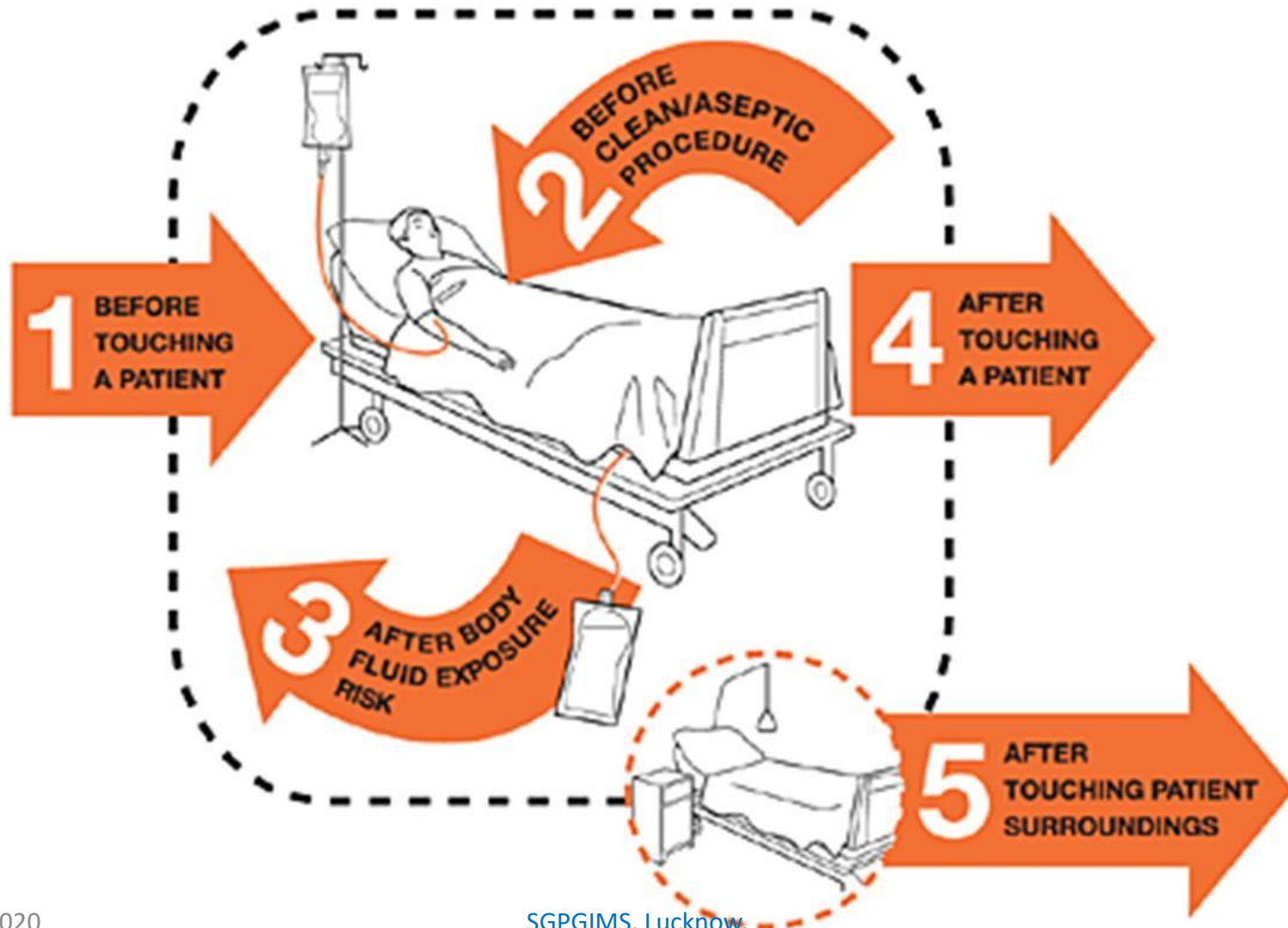
# Hand Hygiene



# What germs are on our hands ??

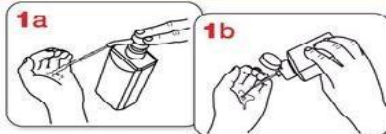


# Hand Hygiene: 5 moments

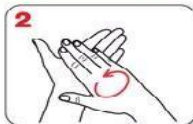


# Hand hygiene: HOW

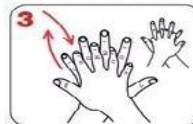
## How to handrub? WITH ALCOHOL-BASED FORMULATION



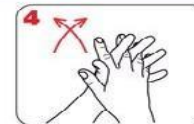
Apply a palmful of the product in a cupped hand and cover all surfaces.



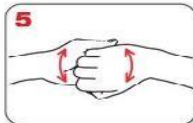
Rub hands palm to palm



right palm over left dorsum with interlaced fingers and vice versa



palm to palm with fingers interlaced



backs of fingers to opposing palms with fingers interlocked



rotational rubbing of left thumb clasped in right palm and vice versa



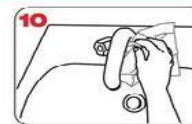
rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa



rinse hands with water



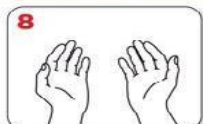
dry thoroughly with a single use towel



use towel to turn off faucet



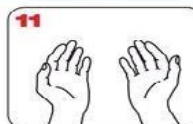
20-30 sec



...once dry, your hands are safe.



40-60 sec



...and your hands are safe.

## How to handwash? WITH SOAP AND WATER



Wet hands with water



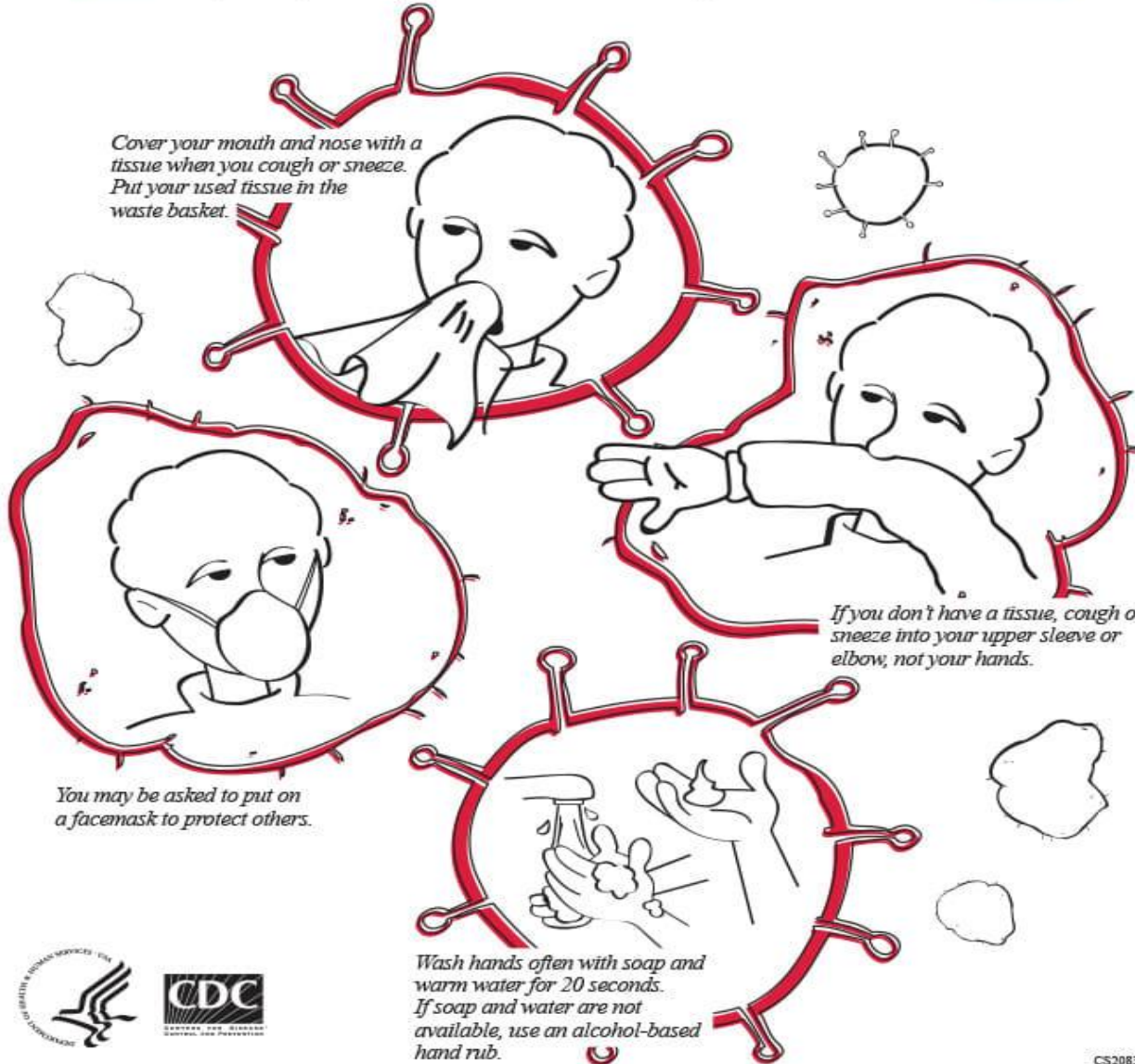
apply enough soap to cover all hand surfaces.



# Cover Cough

— Stop the spread of germs that can make you and others sick! —

*Cover your mouth and nose with a tissue when you cough or sneeze. Put your used tissue in the waste basket.*



*If you don't have a tissue, cough or sneeze into your upper sleeve or elbow, not your hands.*

*You may be asked to put on a facemask to protect others.*

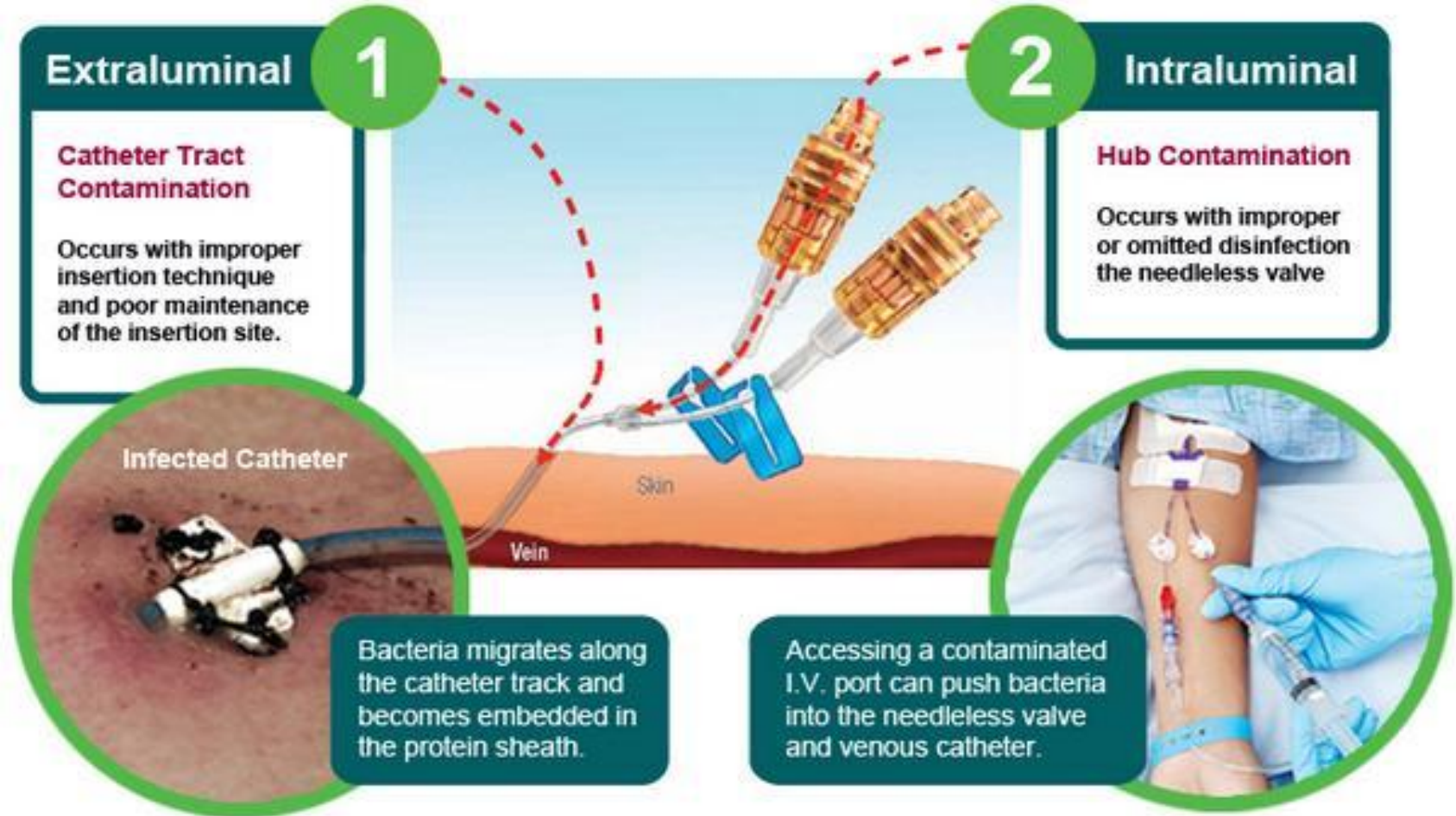
*Wash hands often with soap and warm water for 20 seconds. If soap and water are not available, use an alcohol-based hand rub.*



# Healthcare Associated Infections

## HAIs

# CRBSI

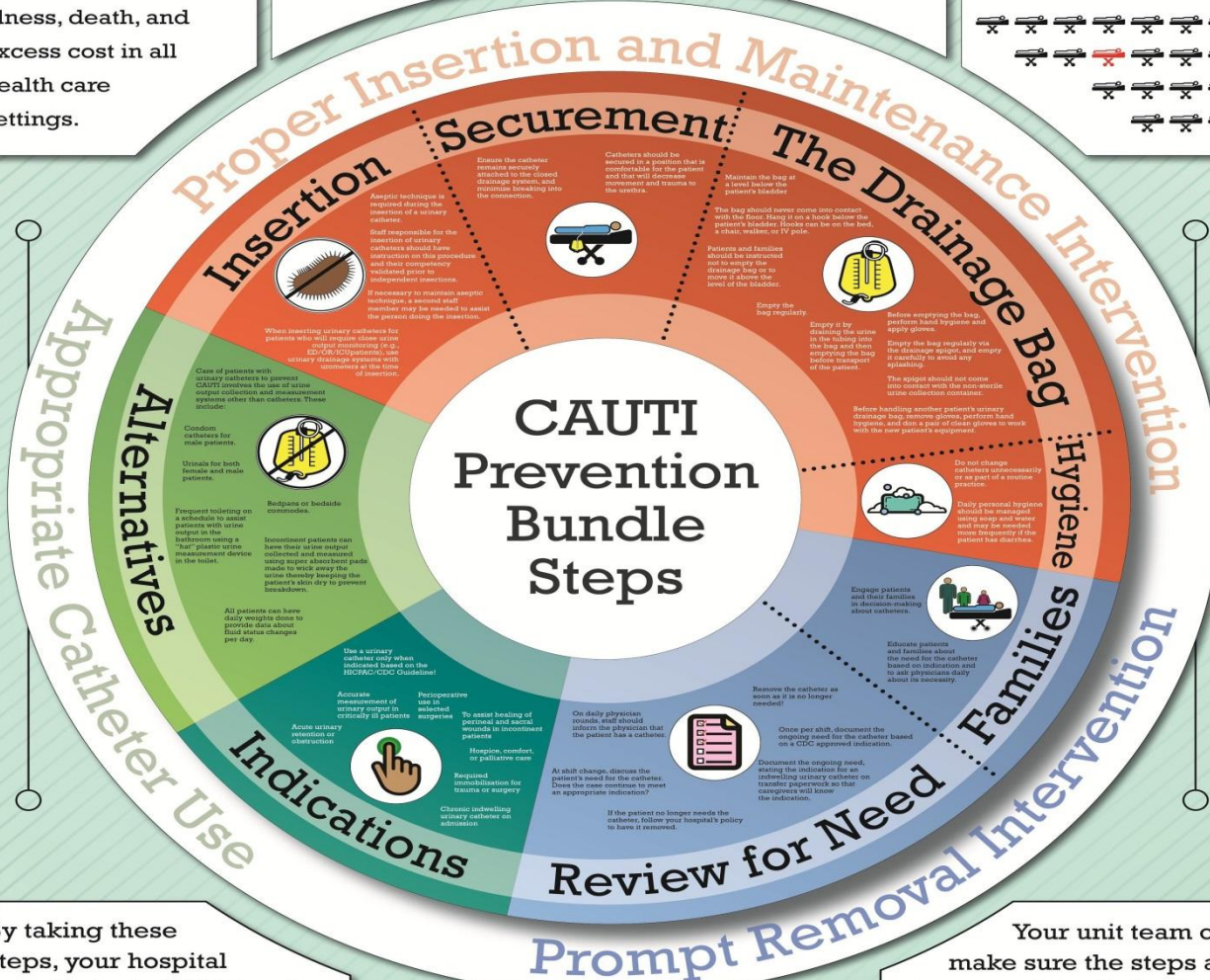
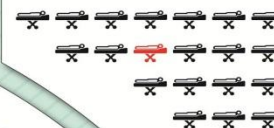




Healthcare-associated infections (HAIs) are a significant cause of illness, death, and excess cost in all health care settings.

Catheter-Associated Urinary Tract Infections are among the most common HAIs in the United States.

At any given time, HAIs affect one out of every 20 hospital patients.



By taking these steps, your hospital can eliminate CAUTI and make care safer for patients.

Your unit team can make sure the steps are done consistently by doing audits, observations, and assessments.

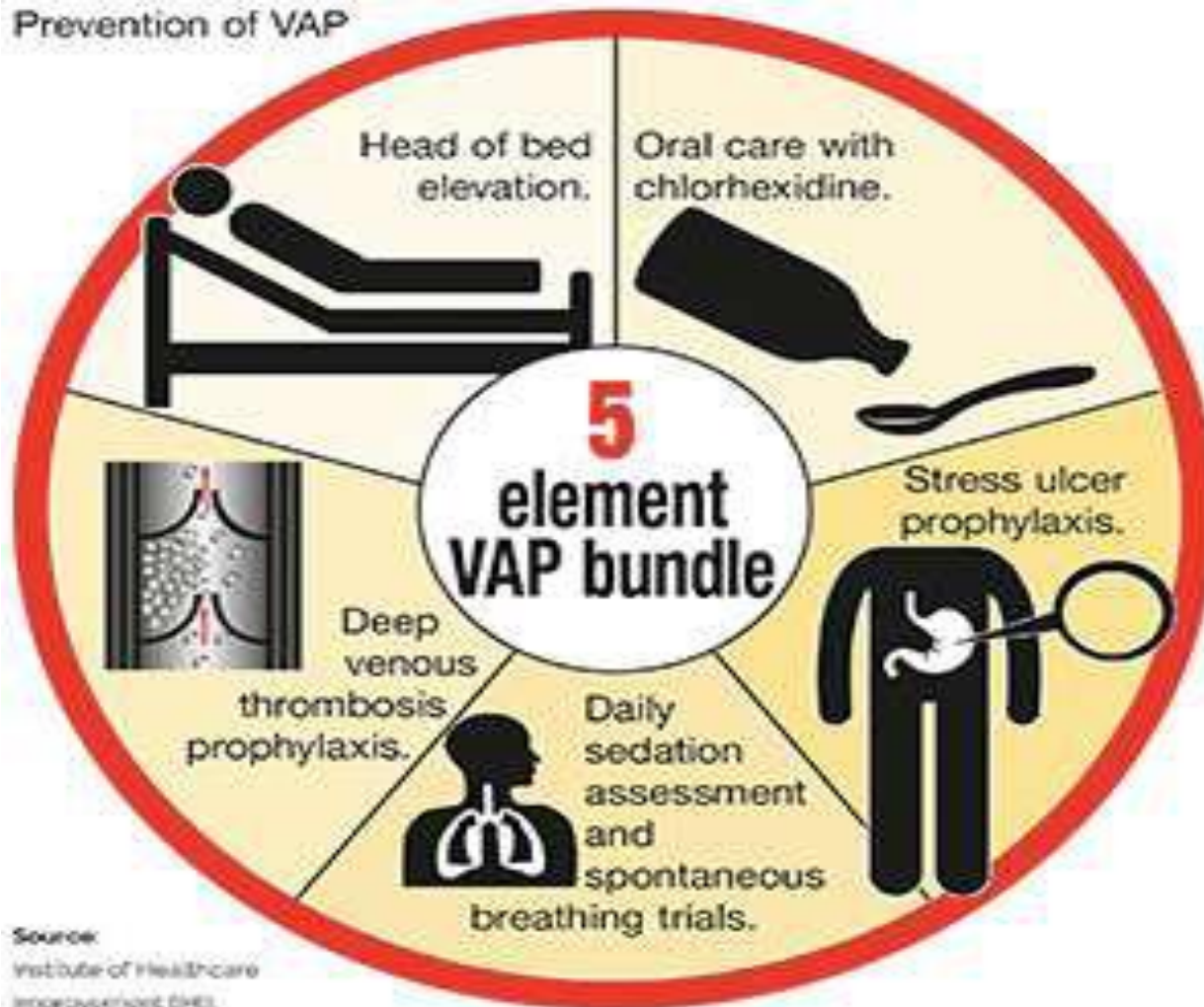
# On the CUSP: Stop CAUTI

National Implementation of the Comprehensive Unit-based Safety Program to Eliminate Catheter-Associated Urinary Tract Infections



# VAP

## Prevention of VAP



# PPE for HCWs COVID-19

**Face Mask**



**Nose +  
mouth**

**N95 Mask**



**Nose +  
mouth**

**Face shield**



**Eyes + nose +  
mouth**

**Goggle**



**Eyes**

**Gown**



**Body**

**Apron**



**Body**

**Gloves**



**Hands**

**Head cover**



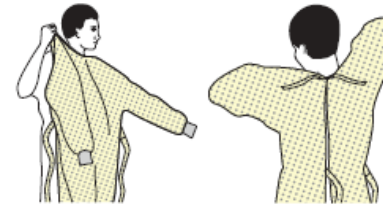
**Head + hair**

## SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

### 1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



### 2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



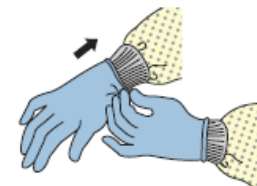
### 3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



### 4. GLOVES

- Extend to cover wrist of isolation gown



## USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

# D O N N I N G

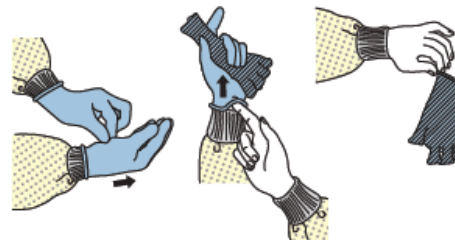
08-04-2020

## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

### 1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



### 3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

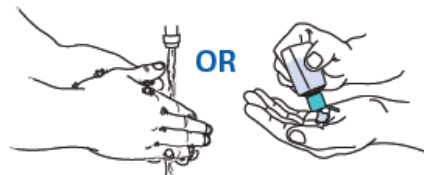


### 4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS  
BECOME CONTAMINATED AND IMMEDIATELY AFTER  
REMOVING ALL PPE**

SGPGIMS, Lucknow.



# OFF



## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

### 1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

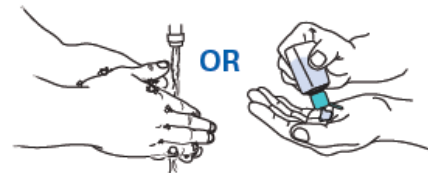


### 3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS  
BECOME CONTAMINATED AND IMMEDIATELY AFTER  
REMOVING ALL PPE**

SGPGIMS, Lucknow.



# Risk Assessment

Risk of exposure & extent of contact anticipated with blood, body fluids, respiratory droplets, and/or open skin

- Select which **PPE items to wear** based on this assessment
- Perform **hand hygiene** according to the WHO “5 Moments”
- Should be done for **each patient, each time, always**

**Make this a Life-saving Habit!**

# COVID-19: Guidelines on rational use of Personal Protective Equipment

Source - Ministry of Health and Family Welfare, Directorate General of Health Services [Emergency Medical Relief]

Patient Care Activities /Area	Risk of Exposure	Triple Layered Mask	N-95 Mask	Gloves	Gown/Coverall	Goggles	Head Cover	Shoe cover
Triage Area in OPD	Moderate risk	X	✓	✓	X	X	X	X
Help desk/ Registration counter	Moderate risk	X	✓	✓	X	X	X	X
Temperature recording station	Moderate risk	X	✓	✓	X	X	X	X
Holding area/ waiting area	Moderate risk	X	✓	✓	X	X	X	X
Doctors chamber in OPD	Moderate risk	X	✓	✓	X	X	X	X
Clinical Management in Isolation rooms	Moderate risk	X	✓	✓	X	X	X	X
ICU facility / Critical Care Ward where aerosol generating procedures are done	High Risk	X	✓	✓	✓	✓	✓	✓
SARI ward - attending to severely ill patients of SARI	High Risk	X	✓	✓	✓	✓	✓	✓
Sample Collection/Sample testing for COVID-19	High Risk	X	✓	✓	✓	✓	✓	✓
Dead Body Packing	High Risk	X	✓	✓	✓	✓	✓	✓
Dead Body Transport	Moderate Risk	X	✓	✓	X	X	X	X
Mortuary - Dead Body Handling	Moderate Risk	X	✓	✓	X	X	X	X
Mortuary- While performing autopsy	High Risk	X	✓	✓	✓	✓	✓	✓
Sanitary staff	Moderate risk	X	✓	✓	X	X	X	X
CSSD/Laundry- Handling linen of COVID-19 patients	Moderate risk	X	✓	✓	X	X	X	X
Visitors attending OPD	Low Risk	✓	X	X	X	X	X	X
Visitors accompanying Patients in IP facility	Low Risk	✓	X	X	X	X	X	X
Supportive services-Administrative Financial Engineering Security, etc	NO risk	X	X	X	X	X	X	X

# The 7 steps

## Safe Injection Practices

1. Clean workspace	
2. Hand hygiene	
3. Sterile safety-engineered syringe	
4. Sterile vial of medication and diluent	
5. Skin cleaning and antisepsis	
6. Appropriate collection of sharps	
7. Appropriate waste management	



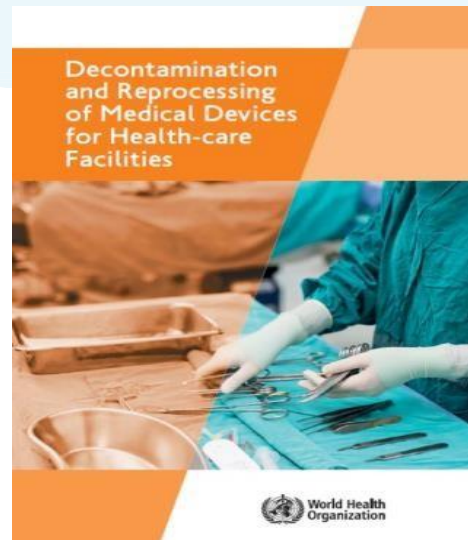
# Decontamination?

Removes soil and pathogenic microorganisms from objects so they are safe to handle, subject to further processing, use or discard

Cleaning

Disinfecting

Sterilization



## Cleaning

The first step required to **physically remove contamination** by foreign material, e.g. dust, soil. It will also remove organic material, such as blood, secretions, excretions and microorganisms, to prepare a medical device for disinfection or sterilization.

## Disinfecting

A process to reduce the number of viable microorganisms to a less harmful level. This process **may not inactivate** bacterial spores, prions and some viruses.

## Sterilization

A validated process used to render an object free from viable microorganisms, including viruses and bacterial spores, **but not prions**

# Principles of Cleaning (1)

## Cleaning:

- Physical **removal of foreign material** (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms).
- Cleaning physically removes rather than kills microorganisms.
- It is accomplished with **water, detergents and mechanical action**

## Basic principles of C&D apply to all patient care areas

- Always be sure to clean patient care equipment between each patient use
- Where possible, dedicate cleaning supplies in higher risk areas (e.g., isolation, delivery, and operating rooms)
- Cleaning supplies for isolation should be kept in and only used in the isolation area/room

Source: CDC and ICAN. Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. Atlanta, GA: US Department of Health and Human Services, CDC; Cape Town, South Africa: Infection Control Africa Network; 2019. <https://www.cdc.gov/hai/pdfs/resource-limited/environmental-cleaning-508.pdf>

# Principles of cleaning (2)

- **Always**

- Move from cleanest to dirtiest area
- Clean from high to low areas, outer to inner
- Clean isolation areas last

- **Damp dusting and wet mopping** is recommended to minimize dust
- Use a **3-bucket system** for C&D
- Use **clean water** for cleaning
- Spraying of disinfectants is **not recommended**

Source: CDC and ICAN. Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. Atlanta, GA: US Department of Health and Human Services, CDC; Cape Town, South Africa: Infection Control Africa Network; 2019. <https://www.cdc.gov/hai/pdfs/resource-limited/environmental-cleaning-508.pdf>

# Environmental cleaning

## isolation rooms/areas



- Increase frequency of cleaning in patient care areas
- Own cleaning supplies that are separate from clean patient care areas
- All waste from the isolation area
  - contaminated
    - should be disposed of following your facilities methods for contaminated waste
- Cleaners/housekeeping staff
  - should wear appropriate PPE
- Cleaning supplies should be kept in and only used in the isolation area/room

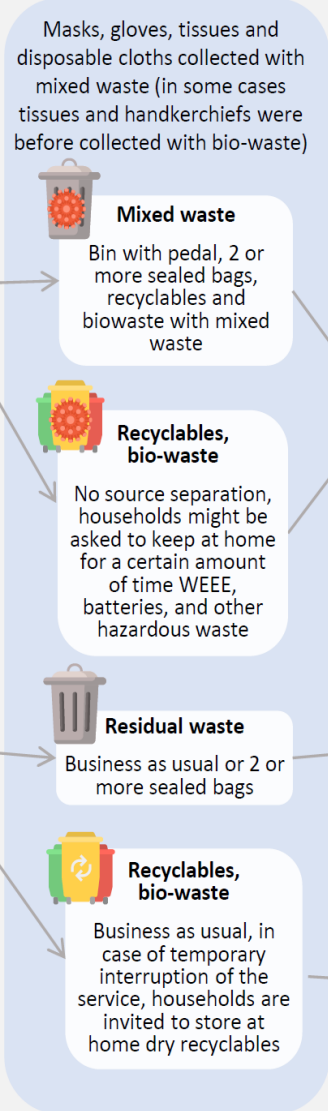
# Municipal waste management and COVID-19

## Summary of observed trends (March 2020)

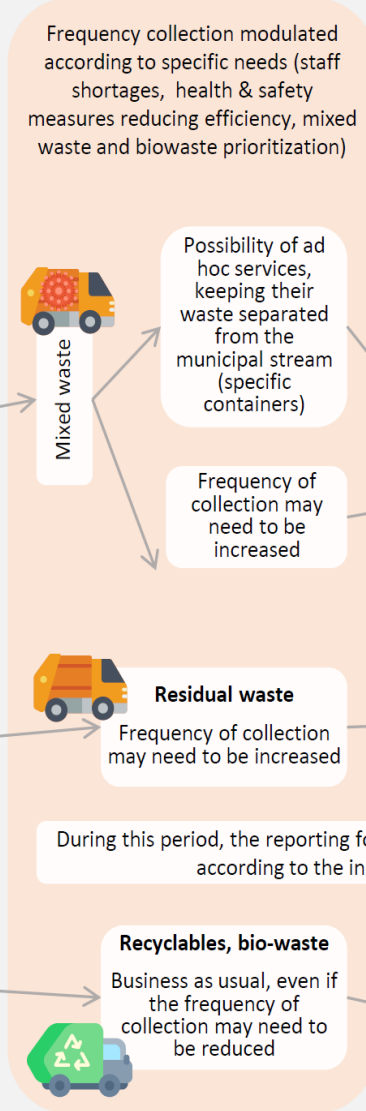
### GENERAL ADAPTATIONS TO MUNICIPAL WASTE SYSTEM



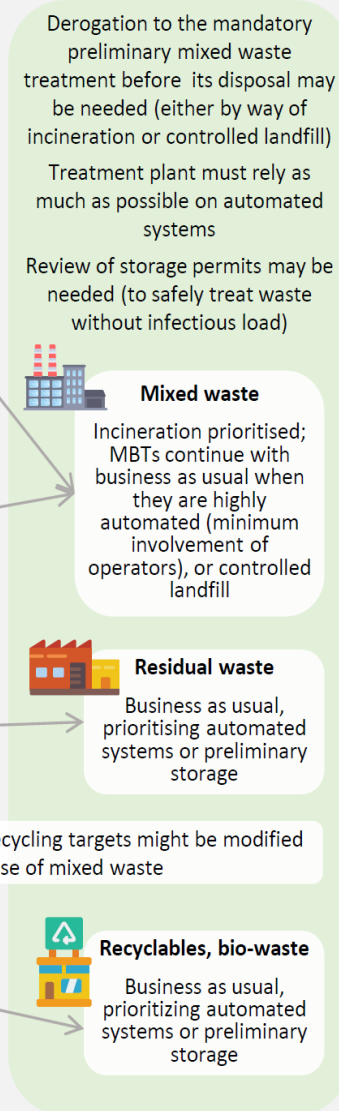
### SORTING RULES AT HOME



### WASTE COLLECTION



### WASTE TREATMENT



This graphic does not include recommendations or an exhaustive list but a reflection in terms of trends of what has been observed in the practices shared with ACR+



**Thanks**

## 5.1.

**Point of Entry**

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Health Desk	Provide information to travellers	Low risk	Triple layer medical mask Gloves	Minimum distance of one meter needs to be maintained.
2	Immigration counters, customs and airport security	Provide services to the passengers	Low risk	Triple layer medical mask Gloves	Minimum distance of one meter needs to be maintained.
3	Temperature recording station	Record Temperature with hand held thermal recorder.	Low risk	Triple layer medical mask Gloves	
4	Holding area/ Isolation facility of APHO/ PHO	Interview & Clinical examination by doctors/ nurses	Moderate Risk	N-95 masks Gloves	
5	Isolation facility of APHO	Clinical management (doctors, nurses)	Moderate Risk	N-95 masks Gloves	
		Attending to severely ill passenger	High risk	Full complement of PPE	When aerosol generating procedures are anticipated
5	Sanitary staff	Cleaning frequently touched surfaces/ Floor/ cleaning linen	Moderate risk	N-95 mask Gloves	
6	Administrative staff	Providing administrative support	No risk	No PPE	No contact with patients of COVID-19. They should not venture into areas where suspect COVID-19 cases are being managed.



### 5.2.1. Out Patient Department (Respiratory Clinic / Separate screening area)<sup>#</sup>

S. No	Setting	Activity	Risk	Recommended PPE	Remarks
1	Triage area	Triaging patients  Provide triple layer mask to patient.	Moderate risk	N 95 mask  Gloves	Patients get masked.
2	Screening area help desk/ Registration counter	Provide information to patients	Moderate risk	N-95 mask  Gloves	
3	Temperature recording station	Record temperature with hand held thermal recorder	Moderate Risk	N 95 mask  Gloves	
4	Holding area/ waiting area	Nurses / paramedic interacting with patients	Moderate Risk	N 95 mask  Gloves	Minimum distance of one meter needs to be maintained.
5	Doctors chamber	Clinical management (doctors, nurses)	Moderate Risk	N 95 mask  Gloves	No aerosol generating procedures should be allowed.
6	Sanitary staff	Cleaning frequently touched surfaces/ Floor/ cleaning linen	Moderate risk	N-95 mask  Gloves	
7	Visitors accompanying young children and elderlies	Support in navigating various service areas	Low risk	Triple layer medical mask	No other visitors should be allowed to accompany patients in OPD settings. The visitors thus allowed should practice hand hygiene

### 5.2.2. In-patient Services

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Individual isolation rooms/ cohorted isolation rooms	Clinical management	Moderate risk	N 95 mask Gloves	Patient masked. Patients stable. No aerosol generating activity.
2	ICU/ Critical care	Critical care management	High risk	Full complement of PPE	Aerosol generating activities performed.
3	ICU /critical care	Dead body packing	High risk	Full complement of PPE	
4	ICU/ Critical care	Dead body transport to mortuary	Low Risk	Triple Layer medical mask  Gloves	
5	Sanitation	Cleaning frequently touched surfaces/ floor/ changing linen	Moderate risk	N-95 mask  Gloves	
6	Other Non-COVID treatment areas of hospital	Attending to infectious and non-infectious patients	Risk as per assessed profile of patients	PPE as per hospital infection prevention control practices.	No possibility of exposure to COVID patients. They should not venture into COVID-19 treatment areas.
7	Caretaker accompanying the admitted patient	Taking care of the admitted patient	Low risk	Triple layer medical mask	The caretaker thus allowed should practice hand hygiene, maintain a distance of 1 meter

### 5.2.3. Emergency Department

S.No	Setting	Activity	Risk	Recommended PPE	Remarks
1	Emergency	Attending emergency cases	Moderate risk	N 95 mask Gloves	When aerosol generating procedures are anticipated
2		Attending to severely ill patients of SARI	High risk	Full complement of PPE	Aerosol generating activities performed.

#### 5.2.4. Pre-hospital (Ambulance) Services

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Ambulance Transfer to designated hospital	Transporting patients not on any assisted ventilation	Moderate risk	N-95 mask  Gloves	
		Management of SARI patient while transporting	High risk	Full complement of PPE	When aerosol generating procedures are anticipated
		Driving the ambulance	Low risk	Triple layer medical mask Gloves	Driver helps in shifting patients to the emergency

### 5.3. Health Workers in Community Setting

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	ASHAs/ Anganwadi and other field staff	Field Surveillance	Low Risk	Triple layer mask  Gloves	Maintain distance of one meter. Surveillance team to carry adequate triple layer masks to distribute to suspect cases detected on field surveillance
2	Doctors at supervisory level conducting field investigation	Field surveillance Clinical examination.	Medium risk	N 95 mask  Gloves.	

#### 5.4 Quarantine facility

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Persons being quarantined		Low Risk	Triple layer mask	
2	Healthcare staff working at quarantine facility	Health monitoring and temperature recording	Low Risk	Triple layer mask Gloves	
		Clinical examination of symptomatic persons	Moderate Risk	N-95 masks Gloves	
3	Support staff		Low Risk	Triple layer mask Gloves	

## 5.5 Home Quarantine

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Persons being quarantined		Low Risk	Triple layer mask	
2	Designated family member	Taking care of person being quarantined	Low Risk	Gloves	While cleaning commonly touched surfaces or handling soiled linen
3	Other family		No Risk	No PPE required	Maintain a distance of at least 1 meter from person under home quarantine. Senior citizens in the household should stay away from such persons under home quarantine.

#### 5.2.5. Other Supportive/ Ancillary Services

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1.	Laboratory	Sample collection and transportation	High risk	Full complement of PPE	
		Sample testing	High risk	Full complement of PPE	
2	Mortuary	Dead body handling	Moderate Risk	N 95 mask Gloves	No aerosol generating procedures should be allowed. No embalming.
		While performing autopsy	High Risk	Full complement of PPE	No post-mortem unless until specified.
3	Sanitation	Cleaning frequently touched surfaces/ Floor/ cleaning linen in COVID treatment areas	Moderate risk	N-95 mask  Gloves	
4	CSSD/Laundry	Handling linen of COVID patients	Moderate risk	N-95 mask  Gloves	
5	Other supportive services	Administrative Financial Engineering Security, etc.	No risk	No PPE	No possibility of exposure to COVID patients. They should not venture into COVID-19 treatment areas.